

AD/A-005 551

MILITARY RAILROADING: A NEW LOOK

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20 November 1974

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER <b>AD/A - 005551</b>
4. TITLE (and Subtitle) <b>Military Railroading-A New Look</b>		5. TYPE OF REPORT & PERIOD COVERED <b>Student Essay</b>
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) <b>LTC William G. Lehn</b>		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS <b>US Army War College Carlisle Barracks, Pa. 17013</b>		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE <b>17 Nov 74</b>
		13. NUMBER OF PAGES <b>28</b>
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) <b>Unclassified</b>
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  <b>Approved for public release; distribution unlimited</b>		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  <div style="text-align: center;"> Reproduced by  <b>NATIONAL TECHNICAL INFORMATION SERVICE</b>  US Department of Commerce  Springfield, VA. 22151 </div> <div style="text-align: right; font-weight: bold;"> <b>PRICES SUBJECT TO CHANGE</b> </div>		
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

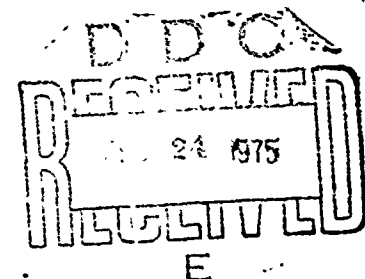
USAWC RESEARCH ELEMENT  
(Essay)

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MILITARY RAILROADING  
A NEW LOOK

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20 November 1974

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distribution unlimited.

AUTHOR: William G. Lehn, LTC, TC  
TITLE: Military Railroading-A New Look  
FORMAT: Essay  
DATE: 17 November 1974  
PAGES: 17

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## MILITARY RAILROADING - A NEW LOOK

### BACKGROUND INFORMATION

In June 1972 the U.S. Army deactivated the 714<sup>th</sup> Transportation Battalion (Railway) and its allied support units at Fort Eustis, Virginia.<sup>1</sup> This Battalion was the last railway operation unit on active duty. By this action the Department of the Army then placed this phase of the transportation mission upon the Army Reserve rail operating units.

As restructuring of the modern Army is constantly being reviewed and re-examined it becomes mandatory that a complete analysis be made of rail capabilities and advantages over other modes of transportation in order to establish the basic TASTA -70 and Throughput Concepts of Army supply operations in limited wars, brush fire skirmishes and all out wars.<sup>2</sup>

In studying various transportation systems in support of military operations, caution must be exercised in basing decision making strictly on the Vietnam War, or any other restrictive conflict. Any model for judging the effectiveness of a transportation network must be taken into consideration, not only past performances but the projection of learned experiences into future operations.<sup>3</sup> Since missions never remain fixed, the effectiveness of any transportation system to support future operations must be based on the ability of these systems to adjust to rapidly changing situations.

The retention of a rail capability in the U.S. Army undoubtedly gives the military planner additional alternatives in planning its transportation mission.<sup>4</sup> Current capabilities should be considered that are now available. Mixtures of transportation systems such as truck, rail and water systems give more alternatives than only a truck or water system.<sup>5</sup> Therefore in studying the various methods of transporting goods and services in CONUS or in an overseas theater of operations, the retention of rail transportation provides additional options and alternatives necessary to accomplish the mission.

#### HISTORY

In the early development of railways in England and the United States their primary motivation in rapid expansion was because of the need for cheaper and better transportation than existing facilities could provide.<sup>6</sup> Railway operations were rapidly expanded because of the reduced cost of transportation. Consumers, manufacturers and exporters gained from cheaper, quicker and more reliable transport.<sup>7</sup> Construction of railroads was also stimulated by the manifest inadequacies of canal, river and land transportation. The first general consequences of Railroad development was the great increase in passenger travel. It did provide rapid, safe and cheap travel for all classes of our society in addition to

increasing our overall social mobility of the population.

The railroads thus enabled the coast to coast development of freight and passenger transportation. Therefore the railroads played a dynamic effect in developing the U.S. economically and socially during the late 19<sup>th</sup> century and early 20<sup>th</sup> century. The railways enjoyed this virtual monopoly until development of the automobile and the construction of super highways to promote truck and auto traffic, and the airlines developing huge jetliners for freight and passenger travel.<sup>9</sup>

The railroads played an important role militarily as early as the Civil War. Troops were maneuvered and deployed to achieve the element of surprise.<sup>10</sup> The railroads were also used strategically to move ammunition food and supplies.

During World War I the railroads played a major role in transporting men and supplies to their intended destinations. During this period there was no other form of transportation capable of providing the services demanded of the military.

During World War II in Europe the combat commander learned to be concerned with transport logistics - the supply of his own forces. This commander also learned that he can maneuver and put into battle no more troops than his logistical resources can support. He must be concerned with relationships between assigned tasks and available combat strengths in men and material.<sup>11</sup>



The capacity, durability and flexibility of the railroads during World War II led General James A. Van Fleet to comment:<sup>12</sup>

"The railroads occupy the primary and basic considerations in any logistical plan. Other means of transport important as they are in specializing situations are only supplemental or auxiliary."

The history of world war II dramatically proved that throughout the European theater, the war closely followed existing railroads pointing out the nearly total dependence of supply and re-supply on rail transportation. A vast body of military experience shows that only the railroads can supply the quantity and quality of transport needed to support modern armies.<sup>13</sup>

The capability of railroads in time of war led Major General Frank A. Heileman to comment:

"The railroads only have the capacity to meet all the military traffic requirements in the United States. A combination of all other types of carriers would not meet all our requirements."

The history of the war in Korea also illustrates how the line of attack followed closely the existing railroad.<sup>14</sup> The outbreak of hostilities in Korea had a marked impact on the Transportation Corp's military rail transportation activities. There developed an immediate need for military rail units and railway equipment for use on the Korean National Railroad, the backbone of the transportation system supporting the UN forces.<sup>15</sup>

The railroads in Korea moved 98% of all tonnage and troops passing through Pusan, the principal port.

The logistical lessons of land wars clearly demonstrate the indispensability of rail transport. Only the railroads can provide and maintain the volume of transportation day after day required by large modern armies, highly mechanized and with great firepower.

General Van Fleet, with his vast experience as a combat commander was forcefully impressed with the ability of the railroads to deliver large quantities of supplies with dependable regularity in the face of continual enemy efforts at interdiction and interruption.<sup>16</sup>

Thus the history of railroading in our military experiences up to and including the Korean War indicates an absolute dependence upon rail service for survival. The battlefield commander could not have existed without the Transportation Military Railway Services provided to the forward battle zones. Tactical moves right to the battlefield were made by rail during the Battle of the Bulge and the Pusan Perimeter.

#### ADVANTAGES OF RAILROADS

After a brief look into the part played by railroads in developing our country and contributing so gallantly in supporting our war efforts the next questions that a military planner must grope and cope with are :

1. Has the military railroad outlived its usefulness ?
2. Can future wars be fought without the need for railroads ?
3. Might there be some specific instances and locations where railroads could be of some benefits ?

4. Under what circumstances could railroads be of military value on the nuclear battlefield ?

To answer these questions it is necessary to look at the basic strengths of military railroads and then to let the planner decide if these advantages can be compromised or substituted with other forms and means of transportation.

The lessons of experience are plain and explicit. The railroads of the United States are a great basic military asset. They are as much a part of the military strength of the nation as the Army, Navy, Air Force and Marines, because none of these great armed services could long operate without logistical support which railroads provide.<sup>17</sup> In case of another war the need for skilled railroad men may be even greater than in past wars. No other form of transport other than railroads, nor all other forms combined could take over the job of railroads because they all lack some of the inherent characteristics on which the military value of railroads is based.<sup>18</sup>

In any future national defense emergency we shall without doubt have an imperative need for the quantity and type of transportation which only the railroads can supply.<sup>19</sup> Therefore, we have now and always will have vital need for strong, vigorous, progressive railroads for combat and strategic requirements.

The specific amount and percentage of goods and services that may be carried by railroads in any future war is difficult to predict due to the many variables associated with a nuclear war.

A study of the Alaska Railroad reveals a crippling and devastating earthquake on Friday, 27 March 1964 which crippled South Central Alaska. (Richter Magnitude 8.4-8.6)<sup>20</sup> This earthquake released twice as much energy as the 1906 earthquake of San Francisco. It produced catastrophic destruction. The Alaska railroad suffered extensive damage to track roadway, bridges and buildings, rolling stock, motive power, docks and terminal equipment.<sup>21</sup> The railroad was nearly totally destroyed south of Anchorage in various parts for over 50 miles to Portage. Thirty five miles of railroad grade sank five to six feet. For 114 miles (Anchorage to Seward) the Alaskan Highway and the railroad ran side by side through the most intense earthquake damage.

Railroad bridges were designed to carry the weight of 2000 HP locomotives, while highways were built to carry vehicular traffic. In spite of all the devastating destruction of the earthquake the Alaska Railroad did not lose a single major bridge while most major highway bridges were either totally destroyed or close to total destruction.<sup>22</sup>

It is of major transportation significance that the railroad was back in service following temporary repairs long before the highway. Although complete repairs took more than two years, temporary repairs after the earthquake allowed the first train to move over the railroad in only three weeks (20 April 1964).<sup>23</sup>

Few outside the railroad industry realize the nature of the technical revolution that has taken place in methods

of rebuilding and repairing railroad tracks and roadways.

This Alaskan earthquake which was felt on land over an area of almost one-half million square miles is an example of the recuperative value of railroads in the face of mass destruction. The ability of railroads to withstand the effects of devastation is pointedly illustrated in Major General Charles G. Holle's address on 13 March 1956. As chief of the Engineers, United States Army, referring to the vast scope and variety of services demanded by the armed forces said:

"The changes in military planning brought by the nuclear age will in no way diminish the need for rail transportation services and may well increase them. I might add that even under the atom bomb blasts on Hiroshima and Nagasaki the railroad structures stood up among the best."<sup>24</sup>

General Holle also declared in case of natural disaster ( as in case of nuclear war ) the railroads move from the necessary category to the vital in the atomic age.

The railroads terrific resistance to disabling damage and its recuperative powers was demonstrated by the North Vietnamese.<sup>25</sup> After bombardment of tracks, bridges and rail equipment, the railroad was immediately put back in service much to the dismay of Allied Commanders. The North Vietnam railroad was skip bombed, shelled with heavy naval guns, cannonaded with ground artillery, strafed with rockets and machine guns, sabotaged and attacked with guerrillas and yet the Red Railroads were never stopped from delivering ammunition and supplies throughout the entire length of the conflict.

Advantages the North Vietnamese railroaders demonstrated were the ability to run trains without lights at night, hide locomotives and cars in tunnels, operate shuttle trains between breaks in the line, construct by-passes and master of the art of deception to simulate bomb hits, remove bridge spans by day and float them downstream. The fact is that there is no fully effective way of putting a railroad out of service and keeping it out of service without a disproportionate outlay of time and resources.<sup>26</sup> This has been demonstrated over and over again since railroads became an important element of warfare.

Railway durability and recuperability has become thoroughly established as principles of military transportation doctrine. Likewise, establishing military doctrine are the principles of railroad capacity and flexibility. The railroads can handle more sizes and kinds of freight under a wider range of operating conditions than any other type of transport.<sup>27</sup>

A doctrine of the Transportation Corp, USA states that these characteristics of durability, capacity and flexibility taken altogether explain why railroads are the basic transportation element in all military planning.<sup>28</sup> The railroad is the logistical "Big Boy" with the other means as helpers and specialists. One only needs to sit back and think of what would happen during extended periods of inclement weather conditions, such as snow, ice, fog, severe rain, bitter cold etc. if the commander was totally dependent on air, truck or inland waterways for his resupply of war materials.

Railroads never stop running in any of the above mentioned obstacles that effect other means of transportation.

A further and possibly more significant advantage of railroads to the U.S. Army is their relationship to National Defense. Railroads are always ready and prepared to meet the demands for transportation in any emergency.<sup>28</sup> They (the railroads) are constantly in a national defense posture fully equipped to handle promptly all traffic present and prospective whether created by preparations for national defense or increase in commercial traffic.<sup>29</sup> This is possible because the tremendous potential for rail plant capability is rarely used to its full capacity.<sup>30</sup> This state of readiness is superior to other means of transportation because , in addition to normal operations, restoration from disaster involves no new experience for trained railroadmen. The damage from enemy bombardment, demolition or sabotage does not differ from landslides, derailments, wrecks, fires, etc.. Only railroads maintain and repair all their own facilities.<sup>31</sup> Other types of transportation rely upon public agencies to repair and restore facilities used except the vehicles themselves.

Railroads thus carry a burden not imposed on their competitors. Although it is an economic disadvantage it is a great advantage to national security to have such skill available for military and defense purposes.<sup>32</sup> The peacetime training of railroaders is therefore continual and forever improving their expertise to be used in the military situation if so desired.

In studying transportation means and methods a critical sensitive issue is fuel, fuel consumption and economy of operation. With the present fuel crisis in our midst and looming more of a problem in the short range period, any military planner must examine savings to the transportation mission in overall costs as well as fuel utilization.<sup>33</sup>

During recent energy shortages the railroads demonstrated their fuel saving capability as well as its environmental compatibility.<sup>34</sup>

For efficiency information and the efficient use of fuel it has been established that railroads get four to six times more freight moved per gallon of fuel than trucks in intercity line haul movements, and the rewards of preventing the diversion of traffic to overburdened highways.<sup>35</sup> Therefore, the railroads are useful to the military planner not only to combat the energy crisis and relieving traffic congestion but to achieve air pollution control benefits. It has also been established that on a gallon for gallon fuel comparison, the airplane takes thirty times as much fuel as a diesel locomotive to move a given amount of payload.<sup>36</sup> As for labor costs in moving a unit of payload the savings ratio by utilizing rail over air is twelve to one.

In a recent New York Times editorial<sup>37</sup> it stated that "A switch to truck transport from existing rail transportation consumes ten times the outlay of energy."



It should be so noted that John W. Ingram, the Federal Railroad Administrator stated in his address on 27 May 1974,<sup>38</sup>

"What railroads do best is to move large quantities of heavy freight over long distances with minimum fuel consumption, minimum manpower and overall minimum cost."

There is no other mode of transportation that can move freight using less fuel per ton mile than the railroads. Therefore it is becoming increasingly apparent with a new focus on inflation and the energy crisis that a re-definition of the use of the various forms of transportation will cause railroad utilization to be given the priority. An American commitment to forms of transportation other than railroads will only be rewarded by diminishing returns. For an increasing mobility of our transport future dictates high speed rail lines supplemented by truck and air on a select basis as the most economic means.

#### MODERNIZED RAILROADS

The railroad industry has undergone technological changes continuously since its inception. As coal burning steam locomotives "give-way" to the powerful diesel locomotives, the railroads are now taking advantage of the long range efficiencies and economies of electrification.<sup>39</sup>

The railroads have gained great economies through developing powerful locomotives to haul over 100 loaded freight cars for movement as a single unit with one three-man train crew. New 6000 horsepower locomotives can move up to 17,000 gross.

trailing tons or 12,000 actual tons of freight.<sup>40</sup>

The governments demand for transportation mounts rapidly in time of war for movement of goods to ports of embarkation in CONUS and for port clearances and movement to tactical units in the theater of operations.<sup>41</sup> With new and improved motive power the wartime traffic problems can easily be achieved provided adequately trained personnel can keep pace with the technological changes. This is true both in the civilian industry as well as the military. In order for the Military Railway Service to react instantly to meet any challenger they must grow with technical developments. Railroads have barely scratched the surface in the use of the computer technology for controlling operations.<sup>42</sup> Control, location, disposition and identification of freight cars are a few computer control operations being developed. Train control over the road, automation of centralized Traffic Control system of signaling and train operations are putting sophistication into railroading. Physical movement of freight cars through terminals, make-up of trains by destination and automated classification yards are further developments that are being expanded. Hot journal box detectors, wheel defect recorders, high load detectors, microwave communications, voice message transmission and car retarders in hump yards are examples of new technology that is making railroading a skilled occupational specialty. These are areas that military railroaders must keep abreast of because the sophistication is being

pioneered in many foreign countries, especially in Europe. If the United States Military Railway service is to supervise, operate, manage or control a European Rail net today its knowledge of new rail technology must be updated through realistic hands-on, dynamic and continuous training.<sup>43</sup>

Trailers on flat cars (TOFC) flexivan service, and piggyback operations along with unit trains are new concepts in railroading that must be developed through inter modal training of military forces to take advantage of the benefits that railroading presents to the military.

Containerization and container movement concepts and systems have great potential for overseas movements since SEATRAN vessels and the transportation of containerized cargo has been facilitated. These new methods are designed to be consistent with the TASTA - 70 and Throughput logistical concepts with regard to Transportation for a Theater of Operations. Containerization is designed to provide cost reductions in preparation, handling, and movement of supplies and equipment, simplify documentation, reduce loss and damage and enhance the safety and security of supplies.<sup>45</sup> Railroads can take maximum advantage of the benefits derived from containerization cargo through the use of unit trains and Piggyback service over high speed rail nets.<sup>46</sup> In highly mobile battlefield the elimination of storage depots and subsequent reliance on piggyback and containers for logistical support fits perfectly into the mission of the military railway service.

### MILITARY RAILROADS ABROAD

A look at the development of the third world nations indicates that super highways are not available to any great extent to place a total reliance on truck transport for extended logistical supply lines. Rail lines throughout China, the Soviet Union and parts of Africa are nearly totally dependent on their railroads for handling of bulk commodities and large volumes of supplies over medium to long distances. Maintenance of equipment is a deterrent to the utilization of heavy lift helicopters and other air craft over extended periods of time. This fact was proven during the Israeli war where aircraft continually in use (for supply of war materials) were hard pressed during the short emergency to keep enough equipment in the air once the maintenance requirements had to be met. The military planner should keep maintenance as a critical issue in comparing aircraft versus diesel locomotives which have a requirement for monthly inspections before being taken out of service.<sup>47</sup>

The future of railroading in Russia is unique in that the railroads are the predominant means of transportation. They are of vital importance to the Russian economic progress as well as a significant political and social function.<sup>48</sup> The Russians regard their railroads as the main physical factor in binding their vast empire.<sup>49</sup> Since railways carry four-fifths of the Russian nation's freight they are the predominant means of transport within this super-power.

Railroads are suited to Russian demands because of extreme weather conditions and severe weaknesses suffered by waterways and roads.

Rail transportation is especially significant in the areas of the NATO countries because Central Europe is a potential battleground for future military encounters. European railways have developed high speed trains (passenger and freight) and have the capability of fulfilling the logistical mission of the mobile nuclear battlefield.<sup>50</sup>

#### RAIL UNITS FOR CONTINGENCY PLANNING

Since the basic concept of rail transportation does present real tangible advantages in meeting the demand for goods and services at a specific time and place, future national defense emergencies can not be adequately handled unless fully trained rail personnel are available to meet the challenge.

To satisfy the vital need for a strong, vigorous, progressive railroad to provide the combat and strategic requirements demands that critical rail personnel be in a constant state of readiness.<sup>51</sup> To maintain the necessary skills and the essential updating with technology growth, the military must dismiss the ill advised notion that rail personnel are readily available from the civilian industry. This fact was true thirty years ago while railroads were financially stable but reduced earnings forced the railroad to abolish the junior employees who were potential military railroaders

during a world conflict.<sup>52</sup>

The 706<sup>th</sup> Transportation Group recommended to the First U.S. Army through its assigned staff study in 1972-1973 that the present rail operating units be doubled in order to provide the nucleus of the minimum rail forces required to supply a field army through a friendly net such as a European battlefield. Operating a rail net through a hostile environment would naturally demand augmented rail operating units.

Peacetime is the time to train military railroaders , not waiting for national emergencies to dictate the need, and not waiting for other forms of transportation to collapse because of their inherent disadvantages.

There is a need for railroads in the military to support the transportation and logistical mission. It would be a grave error to assume that other means of transportation are capable of doing the job assigned to the railroads.

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